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TUNG, B EXAMINER

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PETER I. LIPPMAN
ASHEN & LIPPMAN
4385 OCEAN VIEW BOULEVARD
MONTROSE, CALIFORNIA 91020

ART UNIT	PAPER NUMBER
2615	12

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 11-29-94 and 3-20-95 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), — days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 1,10,19,28; 33-41, 48-50, 55, 56, 62, and 64-98 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☒ Claims 2-9, 11-18; 20-27, 29-32, 42-47, 51-54, 57-61, and 63 have been cancelled.

3. ☒ Claims 1, 10, 19, and 28 are allowed.

4. ☒ Claims 33-41, 48-50, 55, 56, 62, and 64-98 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☒ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

Status of Claims

1. Claims 1, 10, 19, 28, 33-41, 48-50, 55, 56, 62, and 64-98 remain in the application. Claims 1, 10, 19, and 28 have been allowed. Claims 2-9, 11-18, 20-27, 29-32, 42-47, 51-54, 57-61, and 63 have been cancelled.

35 U.S.C. §103

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

3. Claims 33-41, 48-50, 55, 56, 62, and 64-98 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Kato et al and Takaoka et al as set forth in §5 of the last Office action, Paper No.8. The new limitations added by the

amendment filed 3-20-95 are discussed below in conjunction with applicant's arguments.

4. Applicant's arguments filed 3-20-95 have been fully considered but they are not deemed to be persuasive.

(1) Applicant asserts that the sentence quoted on page 30 of the Response is vague and indefinite and that the rejection relies on art that is not relied upon. (Remarks, p.30-31). However, the rejection does not rely on "art" other than Kato et al and Takaoka et al. A backscattering medium is common knowledge in the art. The examiner was simply trying to emphasize the well known character of such a medium. See In re Jacoby, 135 USPQ 317 (CCPA 1962) (holding that artisans must be presumed to know something about the art apart from what the references disclose); see also In re Bozek, 163 USPQ 545 (CCPA 1969) (holding that the conclusion of obviousness may be made from common knowledge in the art without any specific hint or suggestion in a particular reference). In any event, although the examiner does not feel it necessary to rely on Takaoka et al or Kato et al to teach a backscattering medium, Takaoka et al does state that pulsed laser light is effective in combating the effects of such a medium (col.2, ln.12-20).

(2) Applicant asserts that the prior art fails to teach common constraint of the illuminating beam and reflected beam.

(Remarks, p.31). Takaoka et al, however, discloses the possibility of using a thin fan-shaped pulse of laser light (col.1, ln.60-62 and col.2, ln.19-20). Takaoka et al does not use pulsed laser light due to certain drawbacks (col.2, ln.20-31). The streak tube teaching of Kato et al, however, would eliminate these drawbacks, and one of ordinary skill in the art would have seen such a possibility. Figure 1 shows the same spatial definition and directional restriction of the laser light as claimed. Applicant has not proven its allegation of resolution doubling (Remarks, p.32), but even if the assertion were taken as true, the narrow constrained beams of pulsed laser light as contemplated in Takaoka et al together with the streak tube of Kato et al would achieve the same resolution doubling because the combination of Takaoka et al and Kato et al works in the same manner as the present invention.

(3) Applicant asserts that neither Kato et al nor Takaoka et al teaches imaging of a backscattering medium itself as well as objects within the backscattering medium. (Remarks, p.33). As mentioned above, Takaoka et al does disclose the use of an imaging system in a backscattering medium (col.2, ln.12-20). Furthermore, Kato et al does not simply image the object (1A). Rather the images in Figures 6A-6C are images of the object along with the surrounding air. Although neither Takaoka et al nor Kato et al specifically discloses an ocean environment, the

combination of Takaoka et al and Kato et al would function in such a medium given that the very reason Takaoka et al contemplates using pulsed laser light instead of continuous laser light is to combat backscatter and given that an ocean is just another type of backscattering medium. None of the presently claimed elements are used specifically for an ocean medium as opposed to any other backscattering medium.

(4) Applicant asserts that Kato et al is remote from the present invention. (Remarks, p.36). However, because Takaoka et al is a two-dimensional imaging system, one of ordinary skill in the art would have recognized the advantage of having three-dimensional imaging capability. For example, if the purpose of Takaoka et al was to make maps of the Earth's surface, Takaoka et al by itself could only create a flat, two-dimensional map. Given the teaching of Kato et al, however, one of ordinary skill in the art would have recognized the possibility of creating a three-dimensional map (e.g. a raised relief map). Even if Kato et al were designed to be used in a laboratory, that would not preclude its use in another environment like the one disclosed in Takaoka et al.

(5) Applicant asserts that the analogy between Kato et al (cone and air) and the present invention (submarine and ocean) is faulty. (Remarks, p.37). The scanning of Kato et al does not appear "rotational" as Applicant suggests. The plane-shifting,

as in the present invention, is achieved by electrodes (306). When the teaching of Kato et al is combined with Takaoka et al, the need for such electrodes is eliminated because the airplane movement would produce the scanning or "plane-shifting". Thus, applicant's "more natural analogy" is not more natural because the airplane of Takaoka et al is moving (i.e. one of ordinary skill would not look to use the airplane of Takaoka et al as a stationary platform).

(6) Applicant asserts that the present invention was not obvious to Kato et al for their own purposes. (Remarks, p.39). First, Kato et al would not have necessarily used mechanical motion of the instrument. Such mechanical motion would increase the number of moving parts and thus reduce reliability and increase repair costs. Thus, a moving instrument would not necessarily be far cheaper, simpler, easier, and faster as applicant suggests. Furthermore, even if Kato et al performs the slitting function differently than the present invention, this difference is eliminated when Kato et al is combined with Takaoka et al.

(7) Applicant asserts that Takaoka et al is remote from applicant's invention. (Remarks, p.41). Although Takaoka et al is concerned with two-dimensional imaging of the ground, one of ordinary skill, given the three-dimensional imaging system of Kato et al, would have recognized the possibility of creating

true three-dimensional raised relief maps. Furthermore, as noted by applicant, Takaoka et al does disclose the use of an imaging system in a turbid medium. When combined with the teachings of Kato et al, the turbid medium would in fact be imaged along with any objects within it as discussed above.

(8) Applicant asserts that Takaoka et al teaches away from the present invention and that the Kato et al streak tube would not solve the drawbacks noted in Takaoka et al. (Remarks, p.42). Even though Takaoka et al did not see any other solution than discarding the Figure 1 geometry, Takaoka et al did not have the benefit of Kato et al's disclosure as one of ordinary skill in the art at the time of the present invention would. Furthermore, the drawbacks to using pulsed laser light (col.2, ln.20-30) are solved by the particular streak tube system of Kato et al. Whether or not faster circuitry came along later doesn't preclude the use of Kato et al or a finding of obviousness. One of ordinary skill, having Takaoka et al and Kato et al, would have recognized that Kato et al eliminates the Takaoka et al problem of when to pulse the next laser either by faster circuitry or by the particular streak tube used or by some other means.

(9) Applicant asserts that Takaoka et al provides no enabling disclosure. (Remarks, p.46). However, the reason that Takaoka et al does not provide a detailed description of the Figure 1 system is that Takaoka et al did not know how to build

it while overcoming the stated drawbacks. One of ordinary skill in the art, however, given the solution to the drawbacks (i.e. the teachings of Kato et al), would have known how to construct the proposed combination without undue experimentation. Since the Figure 1 system could be made operable given the teaching of Kato et al, Takaoka et al can be properly relied upon. See In re Downie, 152 USPQ 113 (CCPA 1966).

(10) Applicant asserts that the actual invention of Takaoka et al is not compatible with Kato et al. (Remarks, p.47). However, the examiner does not rely on the rotationally side-scanned beam disclosure of Takaoka et al.

(11) Applicant asserts that Takaoka et al and Kato et al are from different arts. (Remarks, p.48). However, both Takaoka et al and Kato et al are concerned with the field of laser imaging.

(12) Applicant asserts that there is no suggestion to combine Takaoka et al with Kato et al. (Remarks, p.48). However, the advantage of three-dimensional imaging as opposed to two-dimensional provides motivation to combine Kato et al and Takaoka et al. Furthermore, the drawbacks to using pulsed laser light provide further motivation to apply the teachings of Kato et al. In any event, it is not necessary that either Takaoka et al or Kato et al expressly state a motivation to combine. See In re Sheckler, 168 USPQ 716 (CCPA 1971); see also In re Conrad, 169 USPQ 170 (CCPA 1971).

(13) Applicant questions why Kato et al did not apply the teachings of Takaoka et al. (Remarks, p.48). However, as noted above, a moving instrument system would not necessarily be easier to implement and could have resulted in a more unreliable system prone to breakdown. In addition, although Kato et al may have seen no need to apply the teaching of Takaoka et al for their specific purpose, that doesn't mean that Takaoka et al (or one of ordinary skill in the art) would not have seen a need to apply the teachings of Kato et al for their specific purpose or a different purpose.

(14) Applicant apparently alleges the use of hindsight. (Remarks, p.49). However, as discussed above, the motivation for combining Takaoka et al and Kato et al comes either from Takaoka et al itself or common knowledge in the art (e.g. preferring three-dimensional viewing to two-dimensional viewing). The motivation does not come from applicant's disclosure.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan S. Tung whose telephone number is (703) 308-6614.

7. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Bryan S. Tung/bst

5-24-95

TOMMY P. CHIN
SUPERVISORY PATENT EXAMINER
GROUP 2600